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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/700,020	11/03/2003	Yusuke Muraoka	P/4178-10	3707
2352	7590	04/19/2007	EXAMINER	
OSTROLENK FABER GERB & SOFFEN			TADESSE, YEWEBDAR T	
1180 AVENUE OF THE AMERICAS			ART UNIT	PAPER NUMBER
NEW YORK, NY 100368403			1734	
SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE		
3 MONTHS	04/19/2007	PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/700,020	MURAOKA ET AL.	
	Examiner	Art Unit	
	Yewebdar T. Tadesse	1734	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 05 February 2007.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 7,8,11-13,17-19,21-23,26,28 and 29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 7,8,11-13,17-19,21-23, 26 and 28-29 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____. | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02/05/2007 has been entered.

Claim Objections

2. Claim 7 is objected to because of the following informalities: the phrase "wherein said first processing solution supply means supplies, as said first processing solution, a developing solution to the substrate for developing" is not clear. For the purpose of examination "wherein said first processing solution supply means supplies a developing solution to the substrate, as said first processing solution, for developing the substrate." Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 7-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Wen (US 6,239,038).

Wen discloses (see Figs 2, 16-19; column 9, lines 7-8 and 14-55) a substrate processing apparatus comprising: substrate retaining means (fingers 42) for retaining a substrate; first processing solution supply means for supplying a first processing solution (chemical –1 with a valve) to the substrate retained by the substrate retaining means thereby subjecting the substrate to a predetermined wet process; second processing solution supply means (chemical –2 or DI-water each connected to a valve) for supplying a rinse liquid as a second processing solution to the substrate retained by the substrate retaining means thereby subjecting the substrate to a rinsing process for removing the first processing solution; and anti-drying solution supply means (chemical-3 with valve capable of supplying anti-drying solution) for supplying an anti-drying solution having a composition which is different from that of the rinse liquid to the substrate subjected to the rinsing process, thereby replacing the rinse liquid adhered to the substrate with the anti-drying solution; wherein the first processing solution supply means capable of supplying a developing solution to the substrate, as the first processing solution, for developing the substrate and the anti-drying solution supply means capable of supplying a replacing solution having a higher affinity with a high pressure fluid than the rinse liquid.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 7-8, 11-13, 17-18, 26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al (US 2002/0160625) in view of Hasebe et al (US 5,826,129) and Wen (US 6,239,038).

As to claim 7, Inoue et al discloses (see Figs 1-2; paragraphs 25, 31 and 46) a substrate processing apparatus comprising a substrate retaining means (wafer holder 102); process solution supply means (a wet processing apparatus 1); and an anti-drying solution supply means (drying apparatus 2 having a protecting liquid supply source 105)

for supplying an anti-drying solution (deionized water) which is different from the processing solution (see paragraph 38, alkali aqueous solution provided for developing in the wet processing apparatus 1) to the substrate subjected to the wet process thereby replacing the processing solution adhered to the substrate with anti drying solution and wherein the first processing solution supply means supplying a developing solution to the substrate, as the first processing solution, for developing the substrate.

Inoue et al further teaches (see paragraphs 38-39) rinsing (supplying of anti-drying solution to the substrate) is performed in the wet processing apparatus 1. However, Inoue et al lacks showing in the drawing the processing solution supply means (wet processing apparatus 1) supplying solution (processing and anti-drying) to a substrate retained by a substrate retaining means. It is well known in the art to retain a substrate by a substrate retaining means such as shown by Inoue et al's drying apparatus (wafer holder 102) retaining the substrate and a spin chuck 426 holding wafer in the developing unit as shown by Hasebe et al (see Fig 27). It would have been obvious to one of ordinary skill in the art at the time the invention was made to retain the substrate by retaining means in Inoue et al to properly apply the processing solution in developing the substrate. Hasebe et al also shows (see Figs 27-30) a developing unit supplied with processing and anti-drying (rinsing) solutions supply means (440 and 453 respectively). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include processing and anti-drying solution supply means in Inoue et al system to prevent capillary force acting on the microstructure of the wafer (see paragraph 46 of Inoue et al). Wen discloses (see Fig 2) a plurality of solution supply

means for supplying a plurality of processing solutions (chemical 1-3) and processing gases in a single processing unit. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a first and a second solution supply means for supplying a first processing solution and a second processing solution to minimize cost by creating an optimum fluid flow or use a minimum processing solution in a narrow spacing (see column 2, lines 36-50).

As to claim 8, Inoue et al discloses (see paragraph 38) a replacing solution (an organic solvent) having a higher affinity with the high-pressure fluid (carbon dioxide) than the processing solution is used as the anti-drying (rinsing) solution.

As to claim 11, Inoue et al further discloses (see Fig 1 and paragraphs 25 and 29-30) a high pressure drying unit (2) for high-pressure drying the substrate by the use a high pressure fluid (supercritical fluid) and a transport unit (3) for transporting the substrate as wetted with the anti-drying solution, from the wet processing unit to the high pressure drying unit (see paragraph 38).

As to claim 12, Inoue et al discloses (see paragraph 38) a replacing solution (an organic solvent) having a higher affinity with the high-pressure fluid (carbon dioxide) than the processing solution is used as the anti-drying (rinsing) solution

With respect to claim 13, in Inoue et al (see Fig 1 and paragraph 33) the transport-unit (wafer transferring apparatus 3) wet-transports the substrate (wafer 9) between the units and a transport container (cassettes 4-1, 4-2 and 4-3) accommodates substrates (wafers 9).

Regarding claims 17-18 and 26, 28, Inoue et al discloses (see Fig 1) a substrate processing apparatus comprising a developing unit (wet processing apparatus 1 capable of alkaline or organic developing process) performing a replacing process (rinsing or replacing with replacing solution) as a final processing of the developing process; a high pressure drying unit (2) for high-pressure drying the substrate by the use a high pressure fluid (supercritical fluid) contacting the surface of the developed substrate performing a predetermined surface treatment (by bringing the unit or vessel to a predetermined supercritical state, see paragraph 43) of developed substrate (wafer) and a transport-unit (wafer transferring apparatus 3) wet-transports the substrate (wafer 9) between a developing unit and a high-pressure processing unit. Furthermore, in Inoue et al the developing unit (wet processing apparatus capable of using liquid preventing the substrate from becoming air-dry during transportation) performs a developing process, a rinsing process, replacing (coating) process (see paragraph 27). However, Inoue lacks teaching a plurality of developing units and a transporting unit accessing a plurality of developing units. Hasebe et al discloses a plurality of developing units (see Fig 3) and a transport unit common to the plurality of developing units (wafer conveyor member 196, see Figs 11-12) accessing the plurality developing units. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a plurality of developing units and a transport unit accessing a plurality of developing in Inoue et al to improve or increase the work efficiency. Wen discloses (see Fig 2) a plurality of solution supply means for supplying a plurality of processing solutions (chemical 1-3, liquids) and processing gases in a single

processing unit, the solutions capable of being developing or rinsing or replacing solution. Additionally Wen discloses a plurality of developing units (see Fig 12). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a first and a second solution supply means for supplying a first processing solution and a second processing solution to minimize cost by creating an optimum fluid flow or use a minimum processing solution in a narrow spacing (see column 2, lines 36-50).

8. Claims 11-13, 17-19 and 21-23, 26 and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wen (US 6,239,038) in view of Hasebe et al (US 5,826,129) or Parodi et al (US 5,651,823).

Wen is cited for the same reasons described above. Wen further discloses (see Fig 2 and 12) an automated multiple processing unit each capable of being used as a developing unit, a wet processing unit or a high pressure drying unit for high-pressure drying the substrate by the use a high pressure fluid (gas 1-3, nitrogen) or a mixture of the high pressure fluid and a chemical agent; the multi-wafer processing unit capable of transferring wafer (see column 7, lines 15-23) and loading and unloading robots (118, 119 see Fig 8) to load the wafer to/from the processing unit and container. However, a transport unit for moving the wafer from one processing unit to another processing unit (transporting the substrate from the wet processing unit to the high pressure drying unit) is not taught in Wen. Yet, the use of a transporting unit transferring the wet/dry substrate from one processing unit to another processing unit is well known in the art as

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evidenced by Hasebe et al (see Figs 3 and 11-12). Parodi et al (US 5,651,823) also discloses a plurality of developing units and a robot common to the plurality of developing units (see Fig 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a transport unit common to the plural developing units and accessing a plurality of processing units in Wen depending the processing steps required.

9. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al (US 2002/0160625) in view of Hasebe et al (US 5,826,129) and Wen (US 6,239,038) as applied to claim 17 above and further in view of Jagannathan et al (US 2004/0043138). Inoue et al as modified lacks teaching a plural number of high pressure processing units. Jagannathan et al discloses (see Fig 1F) a plurality of high pressure processing units (vessels 12a) for treating semiconductor articles. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a plurality of high pressure processing units in Inoue et al for multiple effects or to facilitate the drying process in the production of semiconductor devices.

10. Claims 21-22, 24, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al (US 2002/0160625) in view of Hasebe et al (US 5,826,129) and Wen (US 6,239,038).

In alternative embodiment, Inoue et al discloses (see Fig 3 and paragraphs, 27, 54-55) a substrate processing apparatus comprising a plurality of developing unit (two

or more wet processing apparatus capable of using liquid preventing the substrate from becoming air-dry during transportation, see paragraph 27 the developing unit) for performing different developing processes (capable of performing alkaline or organic developing processes) on a substrate, a replacing unit (vessel 6 with liquid supply apparatus 8) for replacing a solution component adhered to the developed substrate with a replacing solution, a high-pressure processing unit (drying 2) for allowing a high-pressure fluid or a mixture of a high-pressure fluid and a chemical agent, as a processing fluid, to contact a surface of the substrate subjected to the replacing process thereby performing a predetermined surface treatment for the substrate; and a transport unit wt transporting the substrate (wafer transferring apparatus 3 transferring the wafer in the non-dried state), capable of accessing the developing unit, the replacing unit and the high-pressure processing unit, for unloading the developed substrate from the developing unit and for loading the developed substrate into the replacing unit and for unloading the substrate subjected to the replacing process from the replacing unit and for loading the substrate into the high-pressure processing unit, wherein each of the developing unit performs a rinsing process using a rinse liquid after a developing process (see paragraph 38). However, Inoue lacks teaching a transporting unit accessing a plurality of developing units. Hasebe et al discloses a plurality of developing units (see Fig 3) and a transport unit common to the plural developing units (wafer conveyor member 196, see Figs 11-12) accessing a plurality developing units. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a transport unit accessing a plurality of developing in Inoue et al to

improve or increase the work efficiency. Wen discloses (see Fig 2) a plurality of solution supply means for supplying a plurality of processing solutions (chemical 1-3) and processing gases in a single processing unit, the solutions capable of being developing or rinsing or replacing solution. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a first and a second solution supply means for supplying a first processing solution and a second processing solution to minimize cost by creating an optimum fluid flow or use a minimum processing solution in a narrow spacing (see column 2, lines 36-50).

11. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al (US 2002/0160625) in view of Hasebe et al (US 5,826,129) and Wen (US 6,239,038) as applied to claim 21 above and further in view of Jagannathan et al (US 2004/0043138). Inoue et al as modified lacks teaching a plural number of high pressure processing units. Jagannathan et al discloses (see Fig 1F) a plurality of high pressure processing units (vessels 12a) for treating semiconductor articles. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a plurality of high pressure processing units in Inoue et al for multiple effects or to facilitate the drying process in the production of semiconductor devices.

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Parodi et al (US 5,651,823) discloses a plurality of developing units and a robot common to the plurality of developing units (see Fig 1).

Response to Arguments

13. Applicant's arguments filed 02/05/2007 have been fully considered but they are not persuasive. New grounds of rejections are raised in view of Wen alone and/or in combination with others as explained above. Applicants repeatedly argue that in their invention different developing process using different developing solution and different rinse liquid. As described in the rejection above the device disclosed by Inoue et al and Wen as modified is capable of performing the claimed developing processes. It is noted that the amended claims adding limitations directed to the processing materials; for example - in claim 7, the limitation that the first processing solution being a developing solution does not add structure to the claimed limitation. As to claims 17 and 21, plural developing units are shown in Inoue et al, Hasebe et al and Wen; which are capable of performing the claimed alkaline developing process or organic developing process.

A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus shows all of the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987) Furthermore, "expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim." *Ex parte Thibault*, 164 USPQ 666,667 (Bd. App. 1969). Thus, the "inclusion of material or article worked upon does not impart patentability to the claims." *In re Young*, 75 F.2d 966, 25 USPQ 69 (CCPA 1935) (as restated in *In re Otto*, 312 F.2d 937, 136 (USPQ 458, 459 (CCPA 1963))). In this case the type of compositions supplied does not impart patentability to the claimed apparatus.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yewebdar T. Tadesse whose telephone number is (571) 272-1238. The examiner can normally be reached on Monday-Friday 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Fiorilla can be reached on (571) 272-1187. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



YTT